

Remarks

Claims Status

Claims 1-25 are pending. The independent claims are 1, 8, 24, and 25. Claims 8, 9, 12-23, and 25 have been amended herein. Claims 10, 11, and 26 have been cancelled herein. Support for the amendments to claim 8 can be found with reference to claims 10 and 11 of the specification as-filed, their elements being integrated therewith. The amendments to claims 9 and 12-23 were for making their preamble consistent with the amended preamble of claim 8 whereby the claimed subject (i.e. claiming a replaceable insert) was more clearly identified. Support for the amendments to claim 25 can be found with reference to claim 26 of the specification as-filed, the elements of claim 26 being integrated therewith.

Claim Rejections – 35 U.S.C. §102

Claims 8, 9, 12-17, 19, and 25 are rejected under 35 U.S.C. §102(b) as being anticipated by United States Patent No. 5,695,793 (hereinafter the “‘793 patent”). Claims 8 and 25 are the independent claims involved in this rejection.

Anticipation under 35 U.S.C. §102 requires that a reference must teach each and every aspect of the claimed invention; M.P.E.P. §2131. Applicant respectfully submits that the ‘793 patent does not teach each and every element of the present invention as articulated below.

Specifically, the ‘793 patent discloses a typical valve-gated hot runner nozzle assembly, including a nozzle (14) with a two-piece nozzle seal (74) connected to an end thereof, having inner surfaces that define a melt bore (52) for distributing a resin melt from a manifold (12) to a mold gate (16). The mold gate (16) is defined as an integrally formed bore within a cooled mold (20); reference FIG. 2. The two-piece nozzle seal (74) includes a hollow inner piece (76) that is secured to the nozzle (14) by a removable outer piece (78). An inner surface (82) of the hollow inner piece (76) defines a portion of the melt bore (52) and includes a front portion (84). The nozzle assembly also includes a valve stem (86) with a head portion (104) that is configured

to cooperate with an upper portion of an inner surface of the gate (16) bore (shown with reference to FIG. 1), thereby defining a stem sealing portion, for isolating the mold cavity (18) from the melt bore (52); reference '793 column 4, line 13-15. The diameter of the gate (16) is to be substantially the same as the stem head portion (104); reference '793 column 3, lines 44-46. Accordingly, a vestige forming portion that is defined along the gate (16) bore, beneath the sealing portion, must also have substantially the same diameter as the sealing portion. In addition, a gap (118) is provided between the hollow inner piece (76) and the gate defining portion of the mold (20); reference FIG. 2, and column 4, lines 23-25. The foregoing is intended to improve backflow as the valve stem is moved into a closed configuration.

Applicant now claims a replaceable insert (42) for an injection molding apparatus that comprises, *inter alia*, “a body that is configured to be received in the mold adjacent the vestige forming portion, a bore configured in the body for connecting the melt channel of the injection nozzle with the mold cavity, the bore having a sealing portion adjacent the mold cavity for receiving an end portion of the valve stem to stop the communication of molten material to the mold cavity, and the sealing portion of the bore having a diameter that is smaller than that of the vestige forming portion.” (Emphasis added; Claim 8 and also similar language in independent claim 25). Of the benefits provided by the Applicant's claimed invention, the advantageous reduction of gate tearing, when ejecting the molded article, is considered to be the result of, *inter alia*, providing the sealing portion in a replaceable insert that “can easily be replaced when leakage around the end portion (33) of valve stem 18 becomes excessive”, and by a “rapid cooling of an outer circumferential portion (23) of the vestige (26)” that is provided by allowing the sealing portion to be smaller than the vestige forming portion and by arranging the replaceable insert in the mold. (See paragraphs [0031] and [0032]).

In view of the foregoing, in contrast, the '793 patent appears to be addressing the problem of improving melt backflow during the step of valve closing whereas the presently claimed invention addresses, *inter alia*, the problem of gate tearing. **In sharp contrast** to the presently claimed invention, the '793 patent describes a hollow inner

piece (76) that while being replaceable, otherwise lacks the requisite sealing portion, let alone one which is smaller than the vestige forming portion, nor is it configured to be arranged in the mold adjacent a vestige forming portion of the mold cavity for sake of cooling the circumferential area of the gate vestige, but rather is isolated from the mold gate (118) by a thermally insulative gap (118).

A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently, described in a single prior art reference. The identical invention must be shown in as complete detail as contained in the claim. Further, the elements must be arranged as required by the claim. Nowhere in the '793 patent does it disclose, *inter alia*, a replaceable insert having 'a sealing portion', and failing that 'a diameter that is smaller than that of the vestige forming portion', or that it is configured to be 'received in the mold adjacent the vestige forming portion'. The '793 patent does not describe or teach the Applicant's claimed invention, as amended. Accordingly, reconsideration is respectfully requested.

Claim Rejection – 35 U.S.C. §103

Claims 10 and 23 are rejected under 35 U.S.C. §103(a) as being unpatentable over the '793 patent in view of United States Patent No. 6,214,275 (hereinafter the "'275 patent"). Claim 18 is rejected under 35 U.S.C. §103(a) as being unpatentable over the '793 patent in view of United States Patent No. 6,135,757 (hereinafter the "'757 patent"). Claims 20-22 are rejected under 35 U.S.C. §103(a) as being unpatentable over the '793 patent in view of United States Patent No. 6,318,990 (hereinafter the "'990 patent").

'275 Does Not Make the Claimed Structure and Arrangement Obvious

In the subject claims, the Applicant claims, *inter alia*, that the mold includes a gate or a cavity insert and that the replaceable insert is configured to be located therein. While the '275 patent provides a teaching of a conventional gate insert, with an integrally formed valve stem sealing portion and gate vestige forming portion, it is otherwise directed to solving the distinct problem of ejecting partially formed molded

articles, commonly known as short-shots. In view of the stated problem to be solved (i.e. avoiding gate tearing), the Applicant submits that a person of ordinary skill in the art of hot runner and injection mold design would not be motivated to look to, let alone combine, the '794 and the '275 patents that teach solutions to different problems (i.e. improving melt backflow and the ejection of short-shots). Notwithstanding the foregoing, the '275 patent does not in fact describe, depict, or suggest any of the features that are required to remedy the deficiencies of the '794 patent. In particular, the '275 patent depicts and describes a conventional mold having a cavity insert with an integrally formed bore that includes a valve stem sealing portion (38) and a vestige forming portion (42). The sealing portion (38) and the vestige forming portion (42) have common diameter, and as such do not suggest the presently claimed configuration wherein the sealing portion has a smaller diameter than the vestige forming portion. In conclusion, the person of ordinary skill in the art would not have had any reasonable expectation of success that the teaching of the '275 patent would remedy the cited deficiencies of the '793 patent; M.P.E.P. §2143 requires that there must be a reasonable expectation of success.

Accordingly, nowhere in the '275 patent does it remedy the deficiencies of the '793 reference, and consequently the '793 patent and the '275 patent, alone or in combination, do not teach, describe, make obvious the Applicant's claimed structure and arrangement. The advantages and benefits of the claimed language are explained in detail in the subject patent application. Reconsideration is respectfully requested.

'757 Does Not Make the Claimed Structure and Arrangement Obvious

In the subject claim, the Applicant claims that the mold includes a valve stem (18) having an elongated slot (56), on an outside surface thereof, for sake of providing a backflow means. The backflow means assists, in combination with the novel gate structure of the present invention, in addressing, *inter alia*, the problem of gate tearing wherein excess plastic is allowed to flow back into the melt channel (20) of the nozzle (10) as the valve stem is moved into a closed configuration; reference paragraph [0039]. In contrast, the '757 patent provides a teaching of a valve stem (5) having a

backflow feature, comprising a plurality of elongated slots (112) along an outer surface thereof, that prevents trapping of a thin film layer of molten material between the sealing portions of the gate and the stem that might otherwise cause an unacceptable ‘crowning’ of the gate vestige; reference column 2, lines 57-64. Accordingly, the ‘757 patent provides a solution to a different problem (i.e. avoiding crowning) than the present invention (i.e. preventing gate tearing). In view of the stated problem to be solved (i.e. avoiding gate tearing), the Applicant submits that a person of ordinary skill in the art of hot runner and injection mold design would not be motivated to look to, let alone combine, the ‘794 and the ‘757 patents that teach solutions to different problems (i.e. improving melt backflow and the avoidance of gate crowning). Nonetheless, the ‘275 patent fails to describe, depict, or suggest any of the features that are required to remedy the deficiencies of the ‘794 patent as discussed hereinbefore. In particular, the ‘757 patent does not describe or suggest of a replaceable insert that is configured to be received in the mold adjacent the gate vestige forming portion and having a valve stem sealing portion that is smaller than the vestige forming portion. In conclusion, the person of ordinary skill in the art would not have had any reasonable expectation of success that the teaching of the ‘757 patent would remedy the cited deficiencies of the ‘793 patent; M.P.E.P. §2143 requires that there must be a reasonable expectation of success.

Accordingly, nowhere in the ‘757 patent does it remedy the deficiencies of the ‘793 reference, and consequently the ‘793 patent and the ‘757 patent, alone or in combination, do not teach, describe, make obvious the Applicant’s claimed structure and arrangement. The advantages and benefits of the claimed language are explained in detail in the subject patent application. Reconsideration is respectfully requested.

‘990 Does Not Make the Claimed Structure and Arrangement Obvious

In the subject claim, the Applicant claims that the mold includes a replaceable insert (42) that is made from a material having a low thermal conductivity, such as titanium and/or ceramic. By making the replaceable insert from such low thermally conductive materials a heat transfer from the nozzle (10) to the gate to an extent that a

nozzle insulator (14) is not required; reference paragraph [0018]. The '990 patent provides a teaching of a thermal tip nozzle assembly for an injection molding apparatus that includes a sealing ring (90) for arranging a nozzle (18) in an inwardly tapered mold opening (92), and a thermal expansion of the sealing ring (90) provides an improved seal, wherein close manufacturing tolerances of the nozzle (10) can be reduced.; reference column 1, lines 30-41. The sealing ring (90) may be made of titanium or ceramic; reference column 5, lines 36-39. The patent goes on to describe that the gate (22, 130) connecting the nozzle (18) with the cavity (24, 132) is configured in the manifold plate (30), or cavity insert (122); reference FIG. 2 & 7, and columns 3, lines 6-10 and column 4 lines 62-67. In view of the deficiencies of the '793 patent, discussed in the preceding section, the Applicant submits that a person of ordinary skill in the art of hot runner and injection mold design would not be motivated to look to a reference teaching a solution to reducing manufacturing tolerances of a nozzle (18) and expect to remedy said deficiencies. Notwithstanding the foregoing, the '990 patent does not in fact describe, depict, or suggest any of the features that are required to remedy said deficiencies. In particular, the '990 patent depicts and describes a conventional mold having a gate (22, 130) that is an integrally formed opening in the manifold plate (30) or cavity insert (122). There is nothing in the '990 reference that describes or suggests forming the gate in a replaceable insert, nor does the patent describe or suggest a valve stem sealing portion (38), as this is not required in a thermally gated nozzle, that is configured to be smaller diameter than the vestige forming portion. In conclusion, a person of ordinary skill in the art would not have had any reasonable expectation of success that the teaching of the '990 patent would remedy the cited deficiencies of the '793 patent; M.P.E.P. §2143 requires that there must be a reasonable expectation of success.

Accordingly, nowhere in the '990 patent does it remedy the deficiencies of the '793 reference, and consequently the '793 patent and the '990 patent, alone or in combination, do not teach, describe, make obvious the Applicant's claimed structure and arrangement. The advantages and benefits of the claimed language are explained in detail in the subject patent application. Reconsideration is respectfully requested.

Summary

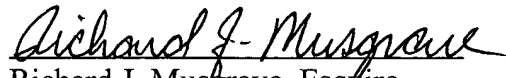
The benefits of the Applicants' claimed device are described in the patent application. This is a unique combination not suggested by the references.

Applicants respectfully submit that there has been no demonstration that the references anticipate or are a *prima facie* showing of obviousness. As such, the rejections under 35 U.S.C. §102 and 103 are improper, reconsideration is requested, and withdrawal of the rejection is respectfully requested.

The Applicant wishes to note that in view of the foregoing the reason for claim amendments entered herewith was simply for sake of clarity.

In view of the above, it is submitted that the claims in this application are allowable, and an early notice of allowance is solicited.

Respectfully submitted,

A handwritten signature in cursive script that reads "Richard J. Musgrave".

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